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IMPLEMENTATION OF A CLINICAL PATHWAY IN THE CARDIOLOGY SERVICE

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In an effort to increase efficiencies and cut unnecessary costs, Walter Reed Army Medical Center (WRAMC) has implemented various Utilization Management (UM) initiatives. One of the major initiatives was the implementation of various clinical pathways throughout the hospital. This project conducted a review of the first comprehensive pathways implemented in WRAMC's Cardiology Services. Specifically the projected reviewed impact of implementing a clinical pathway on the average length of stay (ALOS) for two diagnosis-related groups (DRGs). The two groups were unstable angina (DRG 140) and chest pain/rule out myocardial infraction (MI) (DRG 143). A regression analysis was conducted following the review of the data 6 months prior and 6 months after the implementation of the pathways. The analysis revealed a statistically significant decrease in the ALOS for 2.63 days to 2.17 days equating to over $60,000 in savings in the first 6 months of implementation. Besides the deceased ALOS, WRAMC experienced other benefits to include; increased efficiencies that carried over to other services, an organized methodology to identify patient care issues, and an increased communication among staff members.

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ABSTRACT

In an effort to increase efficiencies and cut unnecessary costs Walter Reed Army Medical Center (WRAMC) has implemented various Utilization Management (UM) initiatives. One of the major initiatives was the implementation of various clinical pathways throughout the hospital. This project conducted a review of the first comprehensive pathways implemented in WRAMCs Cardiology Services. Specifically the projected reviewed the impact of implementing a clinical pathway on the average length of stay (ALOS) for two diagnosis-related groups (DRGs). The two groups were unstable angina (DRG 140) and chest pain/rule out myocardial infarction (MI) (DRG 143). A regression analysis was conducted following the review of the data 6 months prior and 6 months after the implementation of the pathways. The analysis revealed a statistically significant decrease in the ALOS for 2.63 days to 2.17 days equating to over $60,000 in savings in the first 6 months of implementation. Besides the deceased ALOS, WRAMC experienced other benefits to include; increased efficiencies that carried over to other services, an organized methodology to identify patient care issues, and an increased communication among staff members.

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CHAPTER 1

INTRODUCTION

The percentage of the US gross national product (GNP) spent on health care services has steadily increased over the past 30 years. In 1995, the nation consumed over 14% of its GNP on health care and that figure is projected to rise to over 16% by the year 2000 (Rakich 1995). Currently this nation spends over $2,200 per individual on health care annually (Rakich 1995). Although the health of the US population is very important, the nation cannot afford to continue to dedicate such a high percentage of its GNP to health care. The issue of health care expenditures and cost containment have become areas of great concern during this time of competing and dwindling economic resources, especially for federally supported health care programs.

US health care delivery is changing rapidly as it looks for alternative ways to provide high-quality care in a more cost-effective manner. One area that fiscal cuts have affected greatly is the US Department of Defense (DoD). As part of the overall DoD economic plan, the Army Medical Department (AMEDD) is required to share a significant portion of the DoD budgetary cuts.

Like the civilian health care industry, military hospitals must also implement a variety of cost-saving measures. These measures usually involve the more efficient use of existing resources in an attempt to slow spiraling health care costs. Managed care,

case management, and clinical pathways are among the more popular trends in patient care management in the 1990s (Ignatavicius and Hausman 1995).

Conditions Which Prompted the Study

As part of the overall cost cutting strategy, Walter Reed Army Medical Center (WRAMC) has implemented numerous cost saving measures under the direction and guidance of the Utilization Management (UM) Office. One initiative is the implementation of clinical pathways in various departments throughout the hospital. Clinical pathways are detailed patient care plans that outline the best sequencing and timing of treatment for patients with a particular diagnosis (Pearson et al. 1995). They are designed to minimize delays and use of resources while maximizing the quality of patient care.

Clinical pathways are also called critical paths or pathways, care maps, mutidisciplinary action plans (MAPs) or numerous variations of the term (Ignatavicius and Hausman 1995). This paper uses the term clinical pathways to reflect the medical or clinical nature of the treatment plan and to avoid confusion with treatment plans commonly used for patients requiring critical care.

The implementation of clinical pathways at WRAMC was an evolutionary process that began in August 1993 with the establishment of the Utilization Review Committee, URC (WRAMC, Reg 40-92, 1993). The committee was formed to review the hospital's average length of stay, ALOS, the appropriate use of convalescent leave policy, and to advance the implementation of clinical pathways throughout the hospital.

The early pathways focused almost entirely on physician care and did not involve the hospital's ancillary support services (Howell 1997). These patient care plans could be better described as clinical practice guidelines rather than clinical pathways (Howell 1997).

In July 1995 the URC was disbanded and replaced with the Utilization Management Committee, UMC, chaired by the hospital's UM Officer. The new committee's scope and responsibilities increased significantly (WRAMC, Reg 40-92, 1996). The committee began to formalize the hospital's UM efforts and began to encourage the use of clinical pathways. The UMC determined that clinical pathways would be an effective way to improve the quality of patient care while better utilizing the hospital's resources. With the full support of the hospital leadership, the UMC formed an interdisciplinary team to review the hospital's implementation methodology and specifically develop the clinical pathways for various departments throughout the hospital.

The initial step for the team was to identify the target population for which the clinical pathway would be developed (Spinks 1997). The selection process began with the team reviewing the hospital's data on "high-volume, high-cost, and high risk diagnoses" (Spinks 1997). The Cardiology Service was one of the first services selected to institute a comprehensive, interdisciplinary clinical pathway. It was chosen based on the high volume of cardiac patients, high costs for patient care, and initial indication that the ALOS was unnecessarily high for specific categories of patients (Robertson 1997).

In addition to the quantifiable criteria, the service had a high degree of physician interest and support, and an enthusiastic patient care coordinator.

An interdisciplinary team of health care providers developed the pathway over a twelve month period (Robertson 1997). The pathway was implemented specifically for patients diagnosed with unstable angina (DRG 140) or chest pain/rule out myocardial infarction (MI) (DRG 143). Diagnosis-related groups (DRG's) classify patients into major diagnostic categories, based on major body system. The DRG system was developed in the early 1980s and was initially designed to account for hospital workload/output (Kovner 94). This system also classifies and determines the amount of money civilian hospitals can be reimbursed for treating Medicare patients (Thorpe 1994).

The acceptance and initial feedback on the implementation of this clinical pathway was positive. Preliminary results indicated the pathway was successful for many reasons to include the pathway development process, physician participation, patient satisfaction, and improved patient care. Probably the most significant was **indications** that the ALOS had decreased for these patients.

After numerous interviews with Department of Nursing (DON) personnel, it was determined that a study was necessary to determine the effect of clinical pathway implementation on the ALOS within the Cardiology Service. By comparing the ALOS before the introduction of the clinical pathway with the ALOS following the implementation the effects of the pathway can be determined.

Decreased ALOS is correlated with decreased costs to the institution. The cost per occupied bed-day for Cardiology Services in 1994 was approximately $1,300 dollars

(PAD 1994). Beginning in 1995, the hospital is no longer reimbursed based on the number of bed days and category of patients but is reimbursed by category of DRG (Black 1997). Currently the hospital is reimbursed by third party payers, $3,849 for DRG 140 and $3,240 for DRG 143. A decreased ALOS for these two cardiac diagnoses could have a significant impact on the hospital's overall cost saving strategy. A more detailed cost analysis is explained later in the paper.

Since this was one of the first clinical pathways implemented in the hospital, it is important to determine the effects associated with the clinical pathway. In addition, it is important to identify lessons learned so that they can be applied to other services implementing clinical pathways in the hospital. If the implementation of this clinical pathway is successful, it may encourage other departments or services to develop clinical pathways throughout the hospital.

Historical or Environmental Factors

Walter Reed Army Medical Center was established in Washington, DC, was established in 1905 and moved to a new, adjacent facility in October 1978. The hospital is an acute care, teaching, tertiary care facility, and currently operates approximately 450 beds. The average daily census is approximately 320 inpatients and the staff treats over 2,400 outpatients daily (PAD 1996).

The Cardiology Service is one of the busiest and largest departments in the hospital. A major sub-section of this service is the Coronary Care Unit (CCU). The CCU consists of ten patient beds with a central nursing station. Generally, a patient is admitted to the CCU and receives initial treatment and tests, then is transferred to an

adjacent ward named the Cardiac Step-down Unit for the remainder of their inpatient care.

Historically, the hospital CCU treats approximately 1200 patients annually. Fourty percent of the patients admitted to the unit are diagnosed with unstable angina (DRG 140) or chest pain/rule out MI (DRG 143) and are therefore candidates for placement on the clinical pathway. Over the past six years the CCU treated approximately 3,600 patients with angina or chest pain. In an attempt to improve the quality of care to cardiac patients and improve the sections efficiencies, the Cardiology Service implemented the clinical pathway on July 8, 1996 for these categories of patients.

Research Question

The research question that will be examined is: "What was the effect on the average length of stay (ALOS) for DRG's 140 and 143, following the implementation of a clinical pathway at Walter Reed Army Medical Center, Cardiology Sevice ?"

Literature Review

The literature review will consist of a brief history of the health care industry and how the military healthcare system is evolving and has adopted many of the same initiatives taking place in the civilian health care sector. I will then provide a description of the case management and finally a more detailed description of the selection, development, and implementation of clinical pathways.

History of US Health Care

The United States health care system has changed dramatically over the past 50 years. The US health care industry is a combination of various plans of medical coverage, with no single source of governance or health policy, nor is there a single set of shared values or goals among these groups (Rakich, Longest, and Darr 1994). Even though the US health care system is technology advanced it is a very expensive system. The nation expends are over a 1,072 billion dollars a year on health care and the cost is projected to exceed 1,600 billion (more than 16% of GNP) by the year 2000 (Rakich, Longest, and Darr 1994).

Throughout the last fifty years a number of initiatives have been put in place to control health care expenditures and centralize the health care industry. Since 1935 there has been a shift of social welfare programs from state and local governments to the Federal Government. This continued until the 1970s-1980s with the introduction of revenue sharing and other programs (Rakich, Longest and Darr, 1994).

Soon after the passage of Medicare and Medicaid programs in 1964 and 1965, the cost of health care grew at an alarming rate. Although these programs provide significant medical coverage for millions of Americans that had inadequate access they are expensive to provide (Kongstvedt 1995). Data for the period 1950-1990 showed the health care cost percentage increased greater than any other item on the consumer price index (Rakich, Longest, and Darr 1994). This eventually lead to the second revolution in the health care industry, which has been coined the "Era of Cost Containment". The major result of cost containment has been seen through "prospective payment and

managed care, as manifested by diagnosis-related groups and health maintenance organizations" (Wood, Bailey, and Tilkemeier, 1992) .

National Healthcare and Increased Legislation

Throughout the 20th century, numerous national insurance programs were proposed and seriously considered, specifically durning the 1940s, 1960s, and again in the early 1990s (Rakich, Longest, and Darr 1994). The proposed programs varied greatly from moderate to an all-encompassing federal program. The one thing that these proposed programs had in common was that they were all potentially very expensive (Rakich, Longest and Darr, 1994). Numerous factors caused these programs to be defeated to include the high cost and opposition from organized medicine. Though the primary reason was the lack of voter interest because the majority of the population is covered by employee based medical insurance (Rakich, Longest, and Darr 1994).

Prospective Payment System

By the early 1980s a more direct means of cost control was undertaken. Major changes occurred with the passage of legislation in 1983 to established the prospective payment system. With the introduction of this system, hospitals were no longer reimbursed for health care on a dollar-for-dollar basis from Medicare and other third party payers (Ignatavicius and Hausman 1995). This forced hospitals to become more efficient because the reimbursement rate was now based solely on the patient DRG, a fixed / capitiated rate. There was no longer an incentive to keep patients in the hospital to increase reimbusment rate. The incentive was now to minimize unnecessary inpatient

care and the hospital would receive any benefits associated with the additional cost savings (Rakich, Longest, and Darr 1994).

Introduction of HMO's / Kaiser

In addition to the prospective payment system, the 1980s saw an increase in the popularity of Health Maintenance Organizations (HMOs) and managed care. The idea of a capitated budget was introduce almost 50 years earlier by Dr. Sidney Garfield (Kovner 1991). He established a small hospital in the southern California desert to provide medical care on a fee-for-service basis for workers building the Los Angeles aqueduct (Smillie 1991). The traditional fee-for-service did not generate enough revenue so Dr. Garfield developed the idea of having a prepaid, group medical practice. He suggested that the worker's pay him a percentage of their wages to cover all work related illnesses and injuries. He then extended this coverage to include non work related health care services (Smillie 1991).

The prepaid health care service system provides several advantages (Smillie 1991). First, it allowed for a more financially stable environment. Secondly, it shared the financial risk of illness and injury among the enrolled worker's at a reasonable cost. Thirdly, it provided the physicians an incentive to apply health and safety measures to keep the workers healthy. Lastly, it provided a mechanism for physicians to effectively plan the resources necessary to treat a fixed population of patients (Smillie 1991).

In 1938, Mr. Edgar Kaiser persuaded Dr. Garfield to set up a similar plan for the workforce building the Grand Coulee Dam under Mr. Kaiser's management (Smillie 1991). In 1945, Mr. Kaiser extended the workers program by opening it to public

enrollment. This prepaid plan changed the concept of health care delivery in the US and the ramifications are still felt today (Smillie 1991).

Changes in the DoD Healthcare System

As with the US health care environment the DoD health care system continues to change, adapt, and evolve. The same factors that impact on the civilian health care system also effect the DoD system. Managed health care has become a reality in the military health care community, and the desire for quality improvement and need for increased efficiencies are growing daily.

Periodically these initiatives are direct by DoD Health Affairs, the policy making arm of the military health care system. A 1995 memorandum addressed to the Assistant Secretaries of the Army, Navy, and Air Force, from Dr. Joseph (The Assistant Secretary of Defense for Health Affairs) outlined "standard utilization management (UM) practices" (Joseph 1994). It directed the establishment of UM practices for the direct care system and outlined a coordinated UM policy for DoD. This policy specifically directs the MTFs to establish UM plans that include case management, prospective review, concurrent review, discharge planning, and retrospective review.

In an effort to increase hospital efficiency and recognizing the need to put in place a comprehensive central office for UM activities, January 1995, the WRAMC hospital command established a UM office and continues to support numerous UM efforts. Two of the more significant UM initiatives are the establishment of case managers and the implementation of clinical pathways in various services throughout the hospital, which be described in greater detail.

Introduction to Case Management

Case management is a "practice model that uses a systematic approach to identify specific patients and to manage patient care to ensure optimum outcomes costs" (Ignatavicius and Hausman 1995). It is also described as a process to ensure that patients receive the services they need in a coordinated, effective, and efficient manner (Kegal 1996). It is designed to provide a focused care plan that helps eliminate fragmented care and decrease costs (Ignatavicius and Hausman 1995). Under this approach to care the patients treatment is provided by a interdisciplinary team and is typically coordinated by a nurse referred to as a case manager (Ignatavicius and Hausman 1995). There are three principle components to case management and they consist of clinical pathways, case managers, and primary caregivers (Kegal 1996). They all work together to increase efficiencies and improve patient care.

Nearly all hospitals that have implemented case management models have shown a decreased length of stay (LOS) and significant cost savings. For example, at Hennepin County Medical Center in Minneapolis, Minnesota, the ALOS in the intensive care unit for major bowel procedures decreased from 14 days before case management, to 6 days after case management (Bowen 1992).

In addition to cost savings there are numerous other benefits associated with the case management approach to patient care. First, it is reported that customer patient satisfaction and staff satisfaction have improved in many facilities (Ignatavicius and Hausman 1995). Secondly, many non-hospital agencies are encouraging the use of the case management model. Some third-party payers including insurance companies offer

discounts to hospitals that use case managers due to the associated cost savings. In 1995, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) included guidelines that require an "interdisciplinary, collaborative approach to patient care", provided by the case management process (Ignatavicius and Hausman 1995). JCAHO standards now reflect a growing awareness that hospitals can impact on quality by influencing the factors that affect patient care outcomes (Wood, Bailey, and Tilkemeier 1992). Starting in 1998 with a phased in implementation plan, JCAHO will begin to include performance measures as an evaluated portion of the survey process (ACHE 1997).

Case management requires clinical knowledge and is usually performed by registered nurses. For MTFs, the policy directed by DoD Health Affairs requires that case managers be licensed registered nurses or licensed social workers that have a minimum of two years of clinical experience in the appropriate clinical specialty being managed (Joseph 1994).

UM initiatives are also very popular in civilian health care organizations. One initiative that is gaining in popularity and is showing some cost savings, increased efficiencies, and improved patient outcomes are the use of clinical pathways (Newman 1995). In addition, clinical pathways emphasize communication and coordination of care among health care team members (Kowal and Delaney 1996).

Description of Clinical Pathways

As stated earlier, clinical pathways are interdisciplinary plans of care that outline the optimal sequencing and timing of treatment for patients with a particular diagnosis (Pearson, et al. 1995). They are guidelines rather than individualized care plans for patients who have a predictable course of treatment (Kegal 1996).

Clinical pathway techniques were first developed in the 1950s for industry as a tool to identify and manage rate-limiting steps in production processes. The critical pathway method is linked to a similar approach to production called the Program Evaluation and Review Technique (PERT) (Rakich, Longest, and Darr 1994). Pathways are used to coordinate multiple contractors or persons in a project by identifying the key sequence of events, or "critical path", the requirements of which would drive the timeline of the overall project (Rakich, Longest and Darr 1994). This methodology was first modified and applied to the health care industry in the 1980s by the New England Medical Centers Hospitals (Marquette-Owens and Trombley, 1995). The interest in clinical pathways gained in popularity when the prospective payment system forced hospitals to focus greater interests on potential methods to improve hospital efficiency (Pearson 1995).

The idea of standardizing care using patient protocols or routines were introduced into the health care literature more than 20 years ago, however, the environment was not receptive to the concept of clinical pathways until case management was introduced into the hospital setting int eh late 1980's. Clinical pathways are now considered to be an

essential element to the "management of complex patient problems and achievement of improved health care through best practices" (Newman 1995).

Clinical pathways are written patient care plans that usually have four major features: patient outcomes, timelines, collaboration, and comprehensive aspects of care (Ignatavicius and Hausman 1995). Clinical pathways typically list patient daily progress plan and discharge outcomes that a patient should meet before the patient is discharged from the hospital. Timelines are used to provide guidelines for patient treatment and expected recovery. Critical pathways are a collaborative effort and require input from a interdisciplinary team of health care professionals. They track the various aspects of the patient's treatment to include, nutrition, laboratory tests, medications, mobility and activities, education, and discharge planning (Ignatavicius and Hausman 1995). An example of these standard features are shown on the clinical pathways implemented at WRAMC, Appendix 1.

Clinical pathways are typically developed for high-volume, high-cost, or high-risk diagnoses, procedures, or symptoms (Ignatavicius and Hausman 1995). The interest in clinical pathways has increased tremendously during the past several years based on early reports of their potential cost savings. The rapid push for clinical pathway implementation comes from "intense competitive pressures and the persistent evidence of unexplained variation in medical practices" (Pearson 1995)

Benefit from Clinical Pathways

Clinical pathways can be very beneficial for the patient, health care providers and health care organizations (Ignatavicius and Hausman 1995). The patient benefits because they are typically more involved with their treatment. Many hospitals are now providing a modified version of the clinical pathway designed to allow the patient to follow along and better understand the care plan outlined in the pathway (Shukin and Ferniany 1996). It helps the patient identify the major tasks and outcomes that are anticipated each day the while in the hospital (Shukin and Ferniany 1996).

Surprising little attention has been placed on the patients perception of their care subsequent to being placed on a clinical pathway. Literature indicates both positive and negative effects on patient satisfaction (Shukin and Ferniany 1996). Studies contend that patient satisfaction is greater because patients and families are more actively involved in the care process. Although, the potential benefit of the case management and clinical pathway approach may not hold true for those patients who resist involvement (Kegel, 1996). A study conducted by Dr. Shulkin and Dr. Ferniancy, showed that although there were some trends suggesting an improvement in patient satisfaction scores, there was no statistical difference in satisfaction before or after the patient pathway was in use (Shukin and Ferniany 1996).

Benefit to Healthcare Providers

The health care providers benefit from clinical pathways by providing a standardized and organized care regiment for routine patients (Kegal 1996). It improves communication among health care members because they know what is expected and

what outcomes are expected in advance. This approach fosters collaboration among team members and allows professionals from each field to apply their expertise to the clinical pathway (Kegal, 1996). One of the most significant benefits is it provides a mechanism for consistent communication between nurses and all other health care providers (Robertson 1996). Staff members who use clinical pathways as part of case management have reported increased job satisfaction, decreased absenteeism and turnover (Cohen 1991).

Benefit to Healthcare Organizations

The health care organization benefits from the implementation of clinical pathways for various reasons. They assist by integrating quality improvement, utilization management, and risk management activities in the hospital. Clinical pathways also provide a mechanism to track variances in patient care that can be later reviewed to improve patient care and increase efficiencies. In addition, they have been found to demonstrate quality patient care to accreditation bodies such as JCAHO.

Potential Dilemmas Associated with Clinical Pathways

Although the associated benefits of clinical pathways have been widely publicized, literature indicates that the organization must be aware of possible problems with pathway implementation. One dilemma is that clinical pathways can be used as road maps for a plaintiff's attorney in medical malpractice claims. The hospital's liability can be minimized if emphasis and clarification is made that the pathway is a guideline that is flexible enough to individualize, depending on the patients needs and responses (Ignatavicius and Hausman 1995).

Dr. Pearson claims that there have not been sufficient control studies showning that clinical pathways actually reduce LOS, decrease the use of resources, or improve patient satisfaction or outcomes. Pearson and others to include the Society of General Internal Medicine (SGIM) feel that like other promising medical technologies, critical pathways are being distributed before their benefit has been fully evaluated (Pearson 1995) (Lee 1996).

Another dilemma is whether or not to place the pathways on the medical record. Many experts believe that if the pathway is a part of the medical record, it should replace part of the existing documentation. Some hospitals have combined patient care documentation with the pathway (Pearson et al, 1995).

Linda Carpenito, RN, warns that clinical pathways only provide activities for a particular condition and are not a substitute for the health care provider to fully understand the diagnoses. They are only reminders of predictive care for a condition and are not a substitute for proper nursing. All clinical pathways should be "linked to a reference document, that provides the nursing diagnosis, collaborative problems, outcomes, and detailed interventions" (Carpenito 1996)

An article written by Tom Ahrens, RN, titled "Give Credit Where Credit's Due: it's the Practitioner and Not the Pathways", raises similar concerns. He states that because critical pathways by their fundamental limitation: are so basic "that they can only guide novices" (Ahrens 1996). The health care provider ultimately renders the care to the patient and makes them well not the pathway (Ahrens 1996).

Differences between Clinical Pathways and Clinical Guidelines.

Practice guideline are similar to clinical pathways but they have a number of distinct differences. Practice guidelines are based on the best practices developed by professional societies, regulatory agencies, expert panels, or published guidelines such as those written by the Agency for Healthcare Policy and Research (Ignatavicius and Hausman 1995). Practice guidelines are commonly use by pathway teams to assist in the development of clinical pathways (Pearson et al. 1995). Clinical pathways differ in that they are developed by teams from a specific organization and are tailored and designed to reflect the specific asset and limitation that are available to the organization (Schutt 1997).

How to Use the Pathway and Documentation

The clinical pathway is usually located in the patient's medical record or at the patient's bedside (Ignatavicius and Hausman 1995). If it is placed in the medical record, it must be easily accessible, and placed in a location that a physician will look (Pearson 1995). It is reviewed by the caregivers and case managers at the start of each shift and throughout the day.

Early indications are that documentation directly on the pathway can increase efficiencies. As to what extent the clinical pathway will be used as a tool to document patient progress, will be based on individual hospital policy. Following the implementation of a critical pathway at the Orthopedic Professional Nurse Practice Committee at William Beaumont Hospital, Royal Oak, MI a physician commented "It

used to take me 30 to 40 minutes to chart on five different pieces of paper, now I can do it in 10 minutes all on one form" (Mosher et al. 1992).

A large number of case studies document that many benefits maybe derived from providing information system support for clinical processes and documentation. In addition, clinical pathways can be greatly enhanced if the clinical pathway is automated and integrated into the hospital's existing automated record system. DoD is currently fielding a system which will automate the clinical pathway process and documentation system (Spinks 1997). A survey conducted at two MTFs, having implemented DoDs Clinical Information System, CIS, indicate an improvement of over 25% in the completeness of medical documentation, and a significant improvement for JCAHO compliance and scores (Economic Analysis 1996).

Even though pathways are becoming very popular many facilities are not fully automating clinical pathway treatment plans. A survey conducted in 1996 by Hospital & Health Networks found that 80 percent of hospitals are now using clinical pathways or similar standard treatment plans while only 20 percent are using computers to assist in the process (Lumsdon 1996).

Impact on Hospital Costs and ALOS

One of the major motivations and benefits associated with the implementation of pathways is the cost savings and decreased ALOS (Gideon, Morehead, and Petno 1996). A review of the literature reveals this to be true for most hospitals. The following is a review of four studies that indicate positive results subsequent to clinical pathway implementation:

The Pennsylvania Hospital of Philadelphia, PA., instituted changes in the treatment of patients undergoing vascular surgery in order to decrease hospital costs (Calligaro et al. 1995). Following several cost cutting strategies, the hospital implemented clinical pathways for the three most commonly performed types of vascular surgery. The average LOS decreased for all three procedures by over 50 percent, with no significant (.2%) change in mortality rate. The total average decreased from 8.8 to 3.8 days and the annual hospital cost savings totaled over $1.2 million (Calligaro et al. 1995). The results of this study suggest that the commonly performed vascular operations can be "accomplished in a safe manner with significant cost savings by decreasing length of hospital stay" (Calligaro et al. 1995). (Table 1)

Table 1- Impact of Clinical Pathway, Vascular Surgery, Pennsylvania Hospital, 1994

Group/Procedure	EC	Aortic	Bypass	Total
ALOS Before CP	5.1	11.2	9.6	**8.6**
ALOS After CP	1.7	5.9	3.9	**3.8**
Annual Cost Savings	$231, 010	$494,328	$492,107	**$1,267,445**

Similar results were achieved by the Lehigh Valley Hospital of Allentown Pennsylvania. The hospital initiated cost cutting strategies by implementing three separate clinical pathways: angioplasty (PTCA), abdominal aortic aneursysm repair (AAA), and coronary artery bypass (CABG). The initial procedure chosen was in the cardiovascular services "an area that represented DRGs of high cost and volume for the hospital" (Capuano 1995). A review of the data one year following the implementation indicated a decreased ALOS of over 20 percent. (Capuano 1995). (Table 2). These

results also suggest that "same-day admissions, early discharges, and implementation of clinical pathways resulted in significant apparent hospital cost-savings without increase in morbidity of mortality rates" (Capuano 1995).

Table 2 - Impact of Clinical Pathway on ALOS, Lehigh Valley Hospital, PA., 1994

Group/Procedure	PTCA	AAA	CABG	Percent Change
ALOS Before CP	3.7	15.9	10.2	**9.9 %**
ALOS After CP	2.9	11.4	7.7	**7.3 %**
Percentage Change	21.6 %	28.3 %	24.5 %	

Thirdly, a study conducted following the implementation of numerous clinical pathways at Bristol Regional Medical Center (BRMC) in 1993, showed a decrease in costs with no negative effect to the quality of care (Clare et al. 1995). The implementation of the clinical pathways decreased the average LOS for DRG 112 by 40 % and the average cost per case dropped from $20,200 to $11,444. (Table 3). Similar savings were realized for DRG 209 where the ALOS decreased by over 20% (Clare et al. 1995).

Table 3 - Impact of Clinical Pathway on ALOS, Bristol Regional Medical Center (BRMC), TN, 1993

Group/Procedure	DRG 112	DRG 209	Percent Change
ALOS Before CP	10	9.8	**9.9 %**
ALOS After CP	5.9	7.7	**6.8 %**
Percentage Change	41.0 %	21.4 %	

Lastly, Grant Medical Center in Columbus, Ohio, implemented a clinical pathway for trauma patients in the hospital Critical Care Unit (DeWoody and Price, 1994). This

pathway was not based on DRG but rather a body-system approach was used to select the services in which to implement the pathway. The result was a fall in ALOS from 7.27 to 6.46, a decrease of .81 days. On the surface, this finding may not seem that significant but when you factor in the high-volume (1,300) and high-cost ($2,260) of treatment is facored in, this decreased ALOS represented a potential decrease in patient charges of over $2.3 million per year (DeWoody and Price, 1994).

Cost/Benefit Analysis at WRAMC

As stated earlier, WRAMC is attempting to implement cost savings through more efficient use of resources and the implementation of a comprehensive UM program. MTF's throughout the DoD received an additional incentive to increase efficiency based on a monetary UM decrement, for the FY97 budget. The intent of this decrement is to reward MTF's that have aggressive UM programs and to energize those MTF's that remain outside the established norms. WRAMC along with the majority of the Army's MTF's received a 2% decrement for FY97, or 2.4 million dollars (Functional Area Analysis, 1996).

Besides this UM decrement incentive to decrease ALOS it is also important to understand the cost savings associated with the implementation of this clinical pathway. The ALOS dropped from 2.6 to 2.1 days following the implementation of the clinical pathways in cardiology services. In order to arrive at the best cost estimate we must determine what is the average daily cost of care for patients receiving treatment under DRG 140 & 143 at WRAMC. This is obtained by using the cost of what is charged to third party insurance payers and non-beneficiaries that use the military health care

system. In the past a set rate was charged each patient based on the number of days the patient stayed in the hospital, commonly referred to as bed days. This system did not provide the proper incentive for the timely discharge of patients. Beginning in 1995, MTFs charges are based solely on the DRG standard reimbursement rate, so the number of bed days a patient actually stays in the hospital no longer effects the rate the hospital charges (Black 1997).

Each DRG is assigned a relative weight, RW, which is intended to reflect resources used in treating a patient. The higher the RW, the greater the reimbursement payment to the hospital. In the cases of DRG 140, the RW is .6405 and for DRG 143 the RW is .5206. In addition, each year the DoD establishes an Adjusted Standardized Amount, ASA, rate for each MTF. WRAMCs ASA rate is $6,504.40 for FY 96 and $6,204.70 for FY 97 (Black 1997). The RW of the DRG is then multiplied by the ASA rate to determine the rate charged to third party payers to recoup the cost of care in the MTF (Table 4).

Table 4 - Rate/Cost Charged to Third Party Payers at Walter Reed Army Medical Center

Fiscal Year	DRG	RW	X	ASA	=	3rd Party Charge
1996	140	.6405		$6,504		**$4,165**
1996	143	.5206		$6,504		**$3,385**
1997	140	.6205		$6,204		**$3,849**
1997	143	.5223		$6,204		**$3,240**

In order to determine the savings associated with a decrease of a half a day (decrease of 2.6 to 2.1) one must divide the cost of treatment (amount charged to third

party payers) by the ALOS prior to the implementation. The ALOS for DRG 140 was 3 and DRG 143 was 2.6. The ALOS for each DRG must be multiplied by two, to adjust for a half a day because ALOS are considered whole days of treatment. It must be keep in mind that cost savings will vary slightly because the cost of treatment decreased beginning in October 1996 to account for the new FY97 DRG rates (St. Anthony 1996) (Table 5). Based on these calculations it is estimated that the cost savings associated with the implementation of the clinical pathway was over $60,000.

Table 5 - Impact of Clinical Pathway on Cost at Walter Reed Army Medical Center

Fiscal Year	DRG #	3rd Party Charge (÷)	ALOS (x 2) (half day) (x)	# of Patients Post-CP (=)	Total
96 (4th Qtr)	140	$4,165	6	21	$14,577
96 (4th Qtr)	143	$3,385	5.2	38	$24,736
97 (1st Qtr)	140	$3,849	6	5	$ 3,207
97 (1st Qtr)	143	$3,240	5.2	29	$18,069
Total				**93**	**$60,589**

WRAMC and Army MTFs ALOS for DRG 140 and 143

DoD maintains a detailed database on all inpatients that receive treatment at MTFs. Data are updated and stored in a statistical data base system called Patient Activity Statistical Based A, version 2 (PASBA2). A retrospective review of PASBA2 records from 1991 to 1996 indicate that the total number of patients discharged under DRG's 140 & 143 have steadily decreased Department of the Army (DA) wide. In addition, the ALOS and the standard deviation have also decreased over the same time period. Table 6 provides the ALOS of DA for DRG's 140 & 143 during this time

period. This trend is consistent with data at Walter Reed during the same time period, shown in Table 7.

Table 6- Department of the Army, Average LOS for DRG 140 & 143 Combined

Fiscal Year	Total Cases	Mean	Standard Deviation
1991	1425	3.1	3.0
1992	1783	2.6	2.3
1993	1396	2.3	2.6
1994	1268	2.2	1.8
1995	1204	2.2	2.1
1996	853	2.1	1.8

Table 7 -Walter Reed Army Medical Center (WRAMC), Average LOS for DRG 140 & 143 Combined

Fiscal Year	Total Cases	Mean	Standard Deviation
1991	225	4.3	4.0
1992	170	3.9	3.7
1993	187	3.8	5.4
1994	166	3.0	2.3
1995	162	2.8	2.6
1996	163	2.6	2.0

Purpose

The purpose of this study is to examine the effects of implementing a clinical pathway for DRG's 140 and 143 on the average length of stay at Walter Reed Army Medical Center and make appropriate recommendations. The working hypothesis is that the ALOS is influenced by whether or not the patient was placed on the clinical pathway.

Chapter 2

METHOD AND PROCEDURES

A regression analysis was conducted from data on all patients discharged from WRAMC under DRG 140 and 143 for the period of one year, beginning 1 January 1996 and ending 30 December 1996. The time period was selected to coinside with the six month period before and the six month period following the implementation of the pathway. The patient samples were from eligible beneficiaries of the Military Health Service System (MHSS) within the WRAMC catchment area or referred to by other MTF's.

The dependent variable examined was the length of stay, in days (continuous variable) that a beneficiary was an inpatient in the hospital. The independent variable examined was if the patient was placed on the clinical pathway. This binary variable (group membership) was coded as zero for patients admitted prior to the implementation of the clinical pathway (prior to 8 July 1996) and coded as one for those patients who were placed on the clinical pathway, (after 8 July 1996).

The ALOS was quantified in days using a ratio scale. Ratio scales are used when the scale has a true zero point, indicating a complete absence or "none". "Height, weight, and time are measured with ratio scales" (Spatz 1993). ALOS was determined by counting the number of calendar days between the date a patient was admitted and discharged from the hospital.

The sample data was retrieved from PASBA2 data on all patients discharged under DRG 140 and 143 for the six month period prior and the six month period after the implementation of the clinical pathway.

The validity and reliability of the data within PASBA2 has been questioned (Forensic Medical Advisory Service 1994). Although recent information from PASBA indicates that the information is both reliable and valid inaddation they have not received any reports of inaccurate data (Frazer 1997). In addition, WRAMC initiated numerous steps to improve the accuracy of the hospital's DRG reports to include: physician documentation training, improved reference materials, and additional patient coding training. PASBA continues to provide data to countless similar research projects and administrative studies.

The ethical rights of the patients were considered, but because the data retrieval process called for only raw summary information, ethical issues, such as patient confidentiality were not a factor. The sample size of the patient population was also considered. The actual sample size included all patients that met DRG 140 and 143 criteria for calendar year 1996.

Collected PASBA2 data was entered into SPSS® version 6.1.3, a proprietary statistical software package and the file reviewed for correctness and missing data elements. There were no missing data elements. Descriptive statistics, consisting of means and standard deviations were generated for the dependent and independent variables. An alpha confidence level of .05 was set for the predictor equation.

Chapter 3

RESULTS

Descriptive statistics were computed using regression analysis which determined that the implementation of the critical pathway influenced the ALOS. Descriptive statistics derived from the data set indicated a statistically significant decrease in the ALOS from 2.63 days to 2.17 days (refer to Table 8). The regression equation for prediction of average length of stay is, ALOS in days = 2.63 - .56 (Group Membership).

The correlation coefficient, r, was calculated to be 0.15. The t (167) test statistic of 2.02 is statistically significant at the $p = < .05$ level. The F (1, 168) ratio of 4.08 was also statistically significant at the $p < .05$ level. The statistically significant difference between ALOS pre and post clinical pathway groups indicates that group membership influences ALOS.

The coefficient of determination, R^2, calculated to be 0.023 reveals that only 2.3 percent of the variance in the ALOS was accounted for by variance in group membership. Even though the values of R^2 above .6 are considered to be indicators of good validity, the regression equation remains a helpful tool for prediction of ALOS (Spatz 1993).

2

Table 8. --Descriptive Statistics
Average Length of Stay for DRG 140 and 143 for WRAMC (169 Patients)

Variable	Mean	Standard Deviation
Group Membership	0.5	0.5
ALOS- Grand Mean, (days)	2.33	1.8
Grp 0, Non-Clinical Pathway Patients (days)	2.63	2.1
Grp 1, Clinical Pathway Patients (days)	2.08	1.4

Chapter 4
Discussion

The positive results suggest that an organized approach to the proper selection, development, and implementation of a clinical pathway can achieve a decreased ALOS, for a target patient population. The resulting decrease in the ALOS of 19% from 2.6 days to 2.1 is noteworthy. A decreased ALOS is important but it is only one of the many benefits associated with the implementation of this clinical pathways. Other benefits that Walter Reed experienced include; increased efficiencies that carried over to other services, an organized methodology to identify patient care issues, and an increased appreciation among the hospital staff reference the interdisciplinary approach to treating patients.

Perhaps the greatest benefit from the use of clinical pathways has been the enhanced communication and cooperation generated between disciplines. This cooperation has spread into other departments and services throughout the hospital.

Other MTFs may find this study and its results useful when contemplating the implementation of clinical pathways in their hospitals. Although, hospital leadership must be aware that clinical pathways were developed at WRAMC by design and not by chance. The implementation of clinical pathways is an involved process that can not be implemented by just directing them to be put in place. It requires leadership support, increased communication, cooperation, and a fundamental cultural shift on how patient treatment is conducted in the facility.

Further investigation determined that the ALOS was not very high prior to the implementation of the pathways. In accordance with published guidelines, the LOS

norms are 2.9 days for DRG 140 and 2.1 days for DRG 143 (St. Anthony 1997). This issue is really not a major concern because the primary selection criteria centered around high-volume and high-cost diagnoses, therefore the cardiology service remained an appropriate choice.

Since the Cardiology Service implemented the clinical pathway, numerous other departments and services have implemented or are in the process of developing their own pathway. These include the Organ Transplant Service, Vascular Surgery Service, and the Department of Obstetrics and Gynecology.

During the hospital's Joint Commission on Accreditation of Healthcare Organizations survey in September 1996, the nursing surveyor noted that she was very impressed with the Cardiology Service development and the implementation of the pathway at WRAMC. The surveyor also noted that she had spoken with a number of patients placed on the pathway and received many positive comments.

Even though many are happy with the results of initial implementation of this and similar clinical pathways throughout the hospital, WRAMC staff and others must be made aware of possible concerns. Recent reports from the Quality Assurance and Risk Management Committee indicate that there is an increase to the hospital readmission rate (Howell 1997). The committee has requested that all departments review current care plans and discharge criteria to insure that patients are not discharged before completing their treatment plan. Patients should not be discharged early in an attempt to meet critical pathways and ALOS guidelines. It is not know to what extent the

implementation of clinical pathways has contributed to this increase but this maybe a topic of further research.

The variance account for was not very high. This is because many items in the process of admitting, treating and discharging of the patients require a set amount of time and it is difficult to account for the majority of this time without a very detailed time motion analysis. Thus far, no issues which could be responsible for delaying discharge have yet been specifically addressed and so it would seem that using clinical pathways which leads to improved coordination of better services and resources, was the primary factor in reducing length of hospital stay.

Chapter 5
Conclusions and Recommendations

The average length of stay for DRG 140 and 143 decreased by .5 days following the implementation of a clinical pathway at Walter Reed Army Medical Center, Cardiology Services. The decrease of .5 day was even more significant when one considers that the initial ALOS was relatively low, 2.6 days pre-pathway, and the ALOS decreased by almost 20% to 2.1 days for the post-pathway population.

The incorporation of clinical pathways in the cardiology service's into the daily practice of caring for cardiology patients has proven invaluable. Patients now receive more consistent and timely care. The experience of staff members demonstrates that a decreased ALOS and quality patient care can be achieved by the use of clinical pathways for the management of the cardiology patient population.

The challenge of the future will not focus on skills or technology, but on how health care professionals can produce positive outcomes while decreasing costs of care. Clinical pathways are a sensible means to positively affect outcomes, reduce costs, and measure quality (Marquette-Owens and Trombley 1995).

Recommendations include the results of this study be disseminated to all departments throughout the hospital. The Utilization Management Committee, UMC, and health care providers currently utilizing this pathway should be briefed on these successful findings. In addition, the implementation process and methodology used should be shared with other departments and services considering similar clinical pathways.

The results provide an excellent opportunity for mutual learning and sharing of ideas. The positive finding should be shared with other MTFs, and DoD Health Affairs so that they are aware of the positive initiatives that WRAMC and similar facilities are employing in an effort to improve patient care and decrease unnecessary costs.

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Department of Medicine
Housestaff 1997-98

Interns	Juniors	Seniors
Agnello, Victor A.	Balden, Erin Bpr 1676	Fukuda, Mark M. Bpr 1428
Daniels, Colin Y.	Cossentino, Mark Bpr 1444	Gibbs, Barnett Bpr 7163
Daniels, Jasmine T.	Dewyea, Victor Bpr 1562	Gorske, Andrew C. Bpr 1393
Davis, Russell O.	Dunaway, Peter Bpr 1501	Herndon, Thomas M. Bpr 1659
Footit, Bruce M.	Elgin, Eric E. Bpr 1241	Houde, Lisa L. Bpr 1065
Helman, Donald L.	Flynn, Joseph Bpr 1048	Kent, Steven Bpr 0955
Jackson, William L.	Goodwin, George Bpr 1432	Ketchum, Lloyd H. Bpr 1914
Koff, Jonathan M.	Grammar, Geoffrey Bpr	Lee, Timothy C. Bpr 1735
Levandowski, Dale H.	Gray, Bpr	Liveringhouse, John Bpr 4544
McVeigh, Sean K.	Katz, David Bpr 1549	Markwood, Thor Bpr 3698
Osborn, Erik C.	Kelly, William Bpr 1402	Moran, Kimberly A. Bpr 1863
Perkins, Jeremy G.	Morris, Julianne Bpr	Niven, Alexander S. Bpr 1538
Quinn, William J.	Murray, Clinton Bpr 1158	Polhemus, Mark E. Bpr 1498
Sachar, David S.	Polish, Roger Bpr	Simmons, Mark Bpr 4290
Sullenberger, Lance E.	Roop, Stuart Bpr 1893	Tofferi, Jeanne Bpr 4081
	Stocker, Derek Bpr 1669	Chief, Medical Resident Captain Alice Pugh Beeper 991-6348

Swanton, Edward
Bpr 1231

Thomas, Stephen
Bpr 1510

WALTER REED ARMY MEDICAL CENTER
CRITICAL PATHWAY FOR THE CHEST PAIN / R/0 MI PATIENT
DRG 143 EXPECTED LOS 3.5 DAYS
DRG 140 EXPECTED LOS 4.5 DAYS

Allergies:____________
Code Status:____________
Advanced Directives: [] Yes [] No Date____________

Admission Date: ________ Discharge Date: __________
Patient Care Coordinator____________

Reviewed with Patient/family/significant other Date____________
RN Signature____________

Patient's identification

Category	Phase I: Initial Treatment: Admission/Evaluation (ER, Ward 40)	Phase II: Early Response Day_____ (Ward 40/41)	Phase II: Early Response Day_____ (Ward 40/41)	Phase II: Early Response Day_____ (Ward 40/41)	Phase III: Functional Testing Day_____ (Ward 40/41)	Phase I Day __
DIAGNOSIS	[] Atypical Chest Pain, R/O MI [] Unstable Angina [] Unstable Angina, R/O MI	[] Atypical Chest Pain, R/O MI [] Unstable Angina [] Unstable Angina, R/O MI	[] Atypical Chest Pain [] Unstable Angina	[] Atypical Chest Pain [] Unstable Angina	[] Atypical Chest Pain [] Unstable Angina	[] Atyp [] Unst
GENERAL CARE	Activity: Bed Rest, Bedside Commode, OOB to Chair, OOB in Room, Ad Lib Diet: NPO, Cardiac Prudent, Renal, ADA _____cal/day, Other Nutrition Screen Initiated [] Yes [] No Daily Weight: [] yes [] no Intake and Output: [] yes [] no q _____ hrs Other:____________	Activity: Bed Rest, Bedside Commode, OOB to Chair, OOB in Room, Ad Lib Diet: NPO, Cardiac Prudent, Renal, ADA_____cal/day, Other Daily Weight: [] yes [] no Intake and Output: [] yes [] no q_____hrs Other:____________	Activity: Bed Rest, Bedside Commode, OOB to Chair, OOB in Room, Ad Lib Diet: NPO, Cardiac Prudent, Renal, ADA_____cal/day, Other Nutrition Assessment Completed (consult, appointment, packet given) [] yes [] no Daily Weight [] yes [] no Intake and Output: [] yes [] no q_____hrs Other:____________	Activity: Bed Rest, Bedside Commode, OOB to Chair, OOB in Room, Ad Lib Diet: NPO, Cardiac Prudent, Renal, ADA_____cal/day, Other Daily Weight: [] yes [] no Intake and Output: [] yes [] no q_____hrs Other:____________	Activity: Bed Rest, Bedside Commode, OOB to Chair, OOB in Room, Ad Lib Diet: NPO, Cardiac Prudent, Renal, ADA_____cal/day, Other Daily Weight: [] yes [] no Intake and Output: [] yes [] no q_____hrs Other____________	Activit OOB t Diet: I ADA_ Daily V Intake q_ Other_
SYMPTOM CONTROL	[] Angina free [] Recurrent angina [] Refractory Pattern	[] Angina free [] Recurrent angina [] Refractory Pattern [] Non-ischemic chest pain	[] Angina free [] Recurrent angina [] Refractory Pattern [] Non-ischemic chest pain	[] Angina free [] Recurrent angina [] Refractory Pattern [] Non-ischemic chest pain	[] Angina free [] Recurrent angina [] Refractory Pattern [] Non-ischemic chest pain	[] Ang [] Rec [] Refi [] Non
HEMODYNAMICS	Vital Signs: Frequency____________ Pulse Oximetry: [] yes [] no q _____ hrs Telemetry: [] yes [] no Pacemaker: [] yes [] no CHF: [] yes [] no	Vital Signs: Frequency____________ Pulse Oximetry: [] yes [] no q_____hrs Telemetry: [] yes [] no Pacemaker: [] yes [] no CHF: [] yes [] no	Vital Signs: Frequency____________ Pulse Oximetry: [] yes [] no q_____hrs Telemetry: [] yes [] no Pacemaker: [] yes [] no CHF: [] yes [] no	Vital Signs: Frequency____________ Pulse Oximetry: [] yes [] no q_____hrs Telemetry: [] yes [] no Pacemaker: [] yes [] no CHF: [] yes [] no	Vital Signs: Frequency____________ Pulse Oximetry: [] yes [] no q_____hrs Telemetry: [] yes [] no Pacemaker: [] yes [] no	Vital S Frequc Pulse (q__ Telem Pacem
CARDIAC MEDICATIONS	Beta Blocker: [] yes [] no Nitroglycerin: [] yes [] no Ca Ch Blocker: [] yes [] no Antiplatelet : [] yes [] no (aspirin, ticlopidine) Heparin: [] yes [] no	Beta Blocker: [] yes [] no Nitroglycerin: [] yes [] no Ca Ch Blocker: [] yes [] no Ace Inhibitor: [] yes [] no Antiplatelet: [] yes [] no (aspirin, ticlopidine) Heparin: [] yes [] no	Beta Blocker: [] yes [] no Nitroglycerin: [] yes [] no Ca Ch Blocker: [] yes [] no Ace Inhibitor: [] yes [] no Antiplatelet: [] yes [] no (aspirin, ticlopidine) Heparin: [] yes [] no	Beta Blocker: [] yes [] no Nitroglycerin: [] yes [] no Ca Ch Blocker: [] yes [] no Ace Inhibitor: [] yes [] no Antiplatelet: [] yes [] no (aspirin, ticlopidine) Heparin: [] yes [] no	Beta Blocker: [] yes [] no Nitroglycerin: [] yes [] no Ca Ch Blocker: [] yes [] no Ace Inhibitor: [] yes [] no Antiplatelet: [] yes [] no (aspirin, ticlopidine) Heparin: [] yes [] no	Beta B Nitrog Ca Ch Ace In Antipl (aspiri Hepari
LABORATORY DATA (EKG, Echo, Blood Studies)	EKG: [] Normal [] Abnormal, unchanged [] ST-T changes, new or unknown [] AMI evolving (pt falls off pathway)	EKG: [] Normal [] Abnormal, unchanged [] ST-T changes, new or unknown [] AMI evolving (pt falls off pathway)	EKG: [] Normal [] Abnormal, unchanged [] ST-T changes, new or unknown [] AMI evolving (pt falls off pathway)	EKG: [] Normal [] Abnormal, unchanged [] ST-T changes, new or unknown [] AMI evolving (pt falls off pathway)	EKG interpretation if repeated for recurrent chest pain [] Normal [] Abnormal, unchanged [] ST-T changes, new or unknown [] AMI evolving (pt falls off pathway)	EKG i recurre [] Nor [] Abn [] ST- [] AM

Responsible Physician(s) ____________

Nurse 0700-1500 ____________ ____________ ____________ ____________ ____________ ____

Nurse 1500-2300 ____________ ____________ ____________ ____________ ____________ ____

Nurse 2300-0700 ____________ ____________ ____________ ____________ ____________ ____

Category	Phase I: Initial Treatment: Admission/Evaluation (ER, Ward 40)	Phase II: Early Response Day _____ (Ward 40/41)	Phase II: Early Response Day _____ (Ward 40/41)	Phase II: Early Response Day _____ (Ward 40/41)	Phase III: Functional Testing Day _____ (Ward 40/41)	Phase III Day __
LABORATORY DATA (cont)	[] Baseline Lab: CBC, P1, P2, P3, Mg, PT/PTT, UA,Cardiac Isoenzymes)1st set:(date/time drawn)____________ Other Labs:____________ ____________ [] CXR: [] Normal [] Cardiomegaly [] Other: ____________	Card Enzymes: [] Normal [] Abnormal (+ MB) Echocardiogram: EF= WMA [] yes [] no CBC, P1,2,3,Mg, PT/PTT, UA,Cardiac Isoenzymes 2nd set (date/time drawn)____________ 3rd set (date/time drawn)____________ Other Labs____________ Review PTT, platelet count if on heparin	Card Enzymes: [] Normal [] Abnormal (+ MB) Echocardiogram: EF= WMA [] yes [] no Review PTT, platelet ct if on heparin Other Labs____________ Date/time done____________	Card Enzymes: [] Normal [] Abnormal (+ MB) Echocardiogram: EF= WMA [] yes [] no Review PTT, platelet ct if on heparin Other Labs____________ Date/time done____________	Review PTT, platelet ct if on heparin Fasting Lipid Profile GXT results____________	Review P Fasting L GXT Re
RISK ASSESSMENT AND PLAN	[] High risk, proceed to cath ASAP [] High risk, continue medical Rx [] Low//Intermed risk, schedule cath [] Low/Intermed risk, continue med Rx	[] High risk, proceed to cath ASAP [] High risk, continue medical Rx [] Low/Intermed risk, schedule cath [] Low/Intermed risk, continue medical Rx and schedule GXT [] Very low risk, GXT ASAP	[] High risk, proceed to cath ASAP [] High risk, continue medical Rx [] Low/Intermed risk, schedule cath [] Low/Intermed risk, continue medical Rx and schedule GXT [] Very low risk, GXT ASAP	[] High risk, proceed to cath ASAP [] High risk, continue medical Rx [] Low/Intermed risk, schedule cath [] Low/Intermed risk, continue medical Rx and schedule GXT [] Very low risk, GXT ASAP	[] High risk, proceed to cath ASAP [] High risk, continue medical Rx [] Low/Intermed risk, schedule cath [] Low/Intermed risk, continue medical Rx and schedule GXT [] Very low risk, GXT ASAP	[] High ri [] High ri [] Low/In [] Low/In Rx and s [] Very lo
EDUCATION/COMMUNICATION	[] Orient to unit [] Review working diagnosis and management plan with patient and family [] Discuss purpose and potential side effects of medications [] If cath imminent, introduce procedure to patient and family [] Obtain informed consent if procedure planned [] Encourage patient and family to ask questions and express concerns about acute illness, potential and planned procedures, etc. [] Communicate with referring or primary physician as indicated [] Educational material given: ____________ ____________	[] Update diagnosis and lab results for patient and family [] Review medications and any planned changes in therapy [] Pharmacy counseling [] Dietary counseling [] Teach basic pathophysiology of coronary syndromes to patient and family [] Introduce diagnostic catheterization, non-invasive testing (GXT) and revascularization strategies [] Obtain informed consent if procedure planned [] Educational material given:____________ ____________	[] Update diagnosis and lab results for patient and family [] Review medications and any planned changes in therapy [] Pharmacy counseling [] Dietary counseling [] Teach basic pathophysiology of coronary syndromes to patient and family [] Introduce diagnostic catheterization, non-invasive testing (GXT) and revascularization strategies [] Obtain informed consent if procedure planned [] Discuss risk factor modification [] Educational material given:____________ ____________	[] Update diagnosis and lab results for patient and family [] Review medications and any planned changes in therapy [] Pharmacy counseling [] Dietary counseling [] Teach basic pathophysiology of coronary syndromes to patient and family [] Introduce diagnostic catheterization, non-invasive testing (GXT) and revascularization strategies [] Obtain informed consent if procedure planned [] Discuss risk factor modification [] Educational material given:____________ ____________	[] Update diagnosis and lab results for patient and family [] Review medications and any planned changes in therapy [] Pharmacy counseling [] Dietary counseling [] Continue risk factor counseling [] Review GXT results (if done) [] Obtain informed consent if procedure planned [] Communicate with referring or primary physician [] Educational material given:____________ ____________ [] Discharge teaching	[] Update patient an [] Review changes i [] Pharma [] Dietary [] Contin [] Review [] Obtain planned [] Commu primary p [] Educati given. [] Disch
TRIAGE CRITERIA AND DISCHARGE PLANNING		Transfer from CCU if: [] Enzymes negative [] Angina controlled [] Off IV nitrates [] Hemodynamically stable [] Consider Discharge Planning/Social Work Service Consult (See SOP for criteria)	Transfer from CCU if: [] Enzymes negative [] Angina controlled [] Off IV nitrates [] Hemodynamically stable	Transfer from CCU if: [] Enzymes negative [] Angina controlled [] Off IV nitrates [] Hemodynamically stable	Discharge home if: [] Stable and tolerant to medical regimen [] Angina controlled [] Support service referrals and discharge needs reviewed [] Prescriptive and follow-up instructions provided [] Discharge medications reviewed with pharmacist [] Nutrition consult to Outpatient Clinic/Appointment	Discharg [] Stable regimen [] Angina [] Suppor discharge [] Prescri instructio [] Discha pharmaci [] Nutriti Clinic/Ap
SPECIAL NEEDS						
EXPECTED OUTCOMES	[] Angina is controlled [] Patient remains hemodynamically stable [] Anxiety level is reduced [] Patient's knowledge level is increased	[] Angina is controlled [] Patient remains hemodynamically stable [] Anxiety level is reduced [] Patient's knowledge level is increased	[] Angina is controlled [] Patient remains hemodynamically stable [] Anxiety level is reduced [] Patient's knowledge level is increased	[] Angina is controlled [] Patient remains hemodynamically stable [] Anxiety level is reduced [] Patient's knowledge level is increased	[] Patient verbalizes knowledge of discharge instructions [] Patient understands how to access system for follow-up care	[] Patien dischar [] Patien system f